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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/736,196	12/15/2003	Emanuel Beer	5640/C01/DISPLAY/AHRDWR/R	4347

41161 7590 04/19/2005

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EXAMINER

MOORE, KARLA A

ART UNIT PAPER NUMBER

1763

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/736,196

Applicant(s)

BEER ET AL.

Examiner

Karla Moore

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-6 and 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,286,296 to Sato et al. in view of U.S. Patent No. 4,997,364 to McGrath et al. and U.S. Patent No. 3,866,926 to Traum and U.S. Patent No. 5,381,014 to Jeromin et al.

3. Sato et al. disclose the invention substantially as claimed in Figure 1 and comprising: an apparatus through which a substrate is transferred between a first vacuum chamber (3B) and a second vacuum chamber (1), wherein the first vacuum chamber is maintained at a high temperature (column 7, rows 31-38) relative to a temperature maintained within said second vacuum chamber, said second vacuum chamber including a port (opened or closed by gate valve, 2); said apparatus comprising a passageway for receiving said substrate (not numbered); and a thermally isolating interface (2) that reduces heat transfer from said first said first vacuum chamber to said second vacuum chamber (when closed); said thermally isolating interface allowing transfer (when open) of said substrate between said first vacuum chamber and said second vacuum chamber and wherein said first vacuum chamber, said apparatus and said second vacuum chamber are sealed together to form a closed environment having an internal pressure that is less than standard atmospheric pressure.

7. However, Sato et al. fails to teach said thermally isolating interface having a face with a border disposed on said face, the border defining a hole in said thermally isolating interface having dimensions such that said substrate is transferable through said thermally isolating interface; wherein said thermally isolating interface is made of a metal having a thermal conductivity coefficient of less than 1536 Btu inch/(hr)(ft²)(deg F).

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8. McGrath et al. teach the use of a thermally isolating interface (baffle gate chamber, column 1, rows 47-55) for the purpose of permitting a carefully controlled atmosphere and a precise temperature profile to be established in a heating chamber. The interface (Figure 1, 14) comprises a border (facing heating chamber, 12) with a hole having dimensions such that said substrate is transferable through said thermally isolating interface. Further, said thermally isolating interface is made of a stainless steel which is a metal having a thermal conductivity coefficient of less than $1536 \text{ Btu inch/(hr)(ft}^2\text{)(deg F)}$ and specifically about $106 \text{ Btu inch/(hr)(ft}^2\text{)(deg F)}$.

9. It would have been obvious to one of ordinary skill in the art at the time the Applicant's was made to have provided a thermally isolating interface in Sato et al. in order to permit a carefully controlled atmosphere and a precise temperature profile to be established in a heating chamber as taught by McGrath et al.

10. Sato et al. and McGrath et al. disclose the invention substantially as claimed and as described above.

11. However, Sato et al. and McGrath et al. fail to teach the face of the apparatus including a recess such that when said face abuts said port, a thermally isolating volume is defined within said recess. Nor, do Sato et al. teach said thermally isolated volume occupied by a air, which has a thermal conductivity coefficient of less than $1200 \text{ Btu inch/(hr)(ft}^2\text{)(deg F)}$.

12. Traum teaches providing recesses (Figure 2, 22-25, second recess means) in a thermal isolating interface and occupying the volume created with air for the purpose of defining heat insulating cavities between two members (abstract and column 3, rows 16-24 and 56-60). Essentially, Traum teaches that by configuring the isolating interface with recesses the contact area is diminished and heat transfer is reduced.

13. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided recesses with an air occupying volume in Sato et al. and McGrath et al. in order to define heat insulating cavities as taught by Traum.

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14. Sato et al., McGrath et al. and Traum disclose the invention substantially as claimed and as described above;

15. However, Sato et al., McGrath et al. and Traum fail to teach the recesses as beveled recesses.

16. Jeromin et al. teach that a bevel surface can be used between two abutting surfaces to reduce contact surface area (column 4, rows 20-24).

17. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided the recesses in Sato et al., McGrath et al. and Traum with a beveled shape in order to further reduce contact area as taught by Jeromin et al.

18. With respect to claims 2 and 13, said first chamber is a heat chamber and said second chamber is a transfer chamber (column 4, rows 17-25).

19. With respect to claims 3 and 4, as noted above, McGrath et al. teach the use of a stainless steel which is a metal having a thermal conductivity coefficient of less than 1536 Btu inch/(hr)(ft²)(deg F) and specifically about 106 Btu inch/(hr)(ft²)(deg F).

20. With respect to claims 5-6 and 14, as described above, Traum teaches providing recesses (Figure 2, 22-25, second recess means) in a thermal isolating interface and occupying the volume created with air, which has a thermal conductivity of less than 1200 Btu inch/(hr)(ft²)(deg F), for the purpose of defining heat insulating cavities between two members (abstract and column 3, rows 16-24 and 56-60).

21. With respect to claim 11, the substrate is a semiconductor substrate or a glass substrate (column 1, rows 8-9). However, Examiner notes that the courts have ruled that inclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims. In re Young, 75 F.2d 966, 25 USPQ 69 (CCPA 1935) (as restated in In re Otto, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963)).

22. The limitations of independent claims 12 and 15 are addressed above, as each of these claims are broader versions of independent claim 1.

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23. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. and McGrath et al., Traum and Jeromin et al. as applied to claims 1-6 and 11-15 above, and further in view of U.S. Patent No. 5,980,991 to Sakamoto et al.

24. However, Sato et al., McGrath et al., Traum and Jeromin et al. fail to teach said passageway further comprises a heating element for maintaining said apparatus at a temperature that is proximate said high temperature.

25. Sakamoto et al. teach the use of heating elements within a thermally isolating interface (gradually cooling zone) for the purpose of gradually cooling a substrate (column 19, rows 5-6 and column 22, rows 20-24). Further said passageway further comprises a heat distribution mechanism, air, for distributing heat generated by said heating element.

26. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a heating element in Sato et al., McGrath et al., Traum and Jeromin et al. fail in order to maintain said apparatus at a temperature proximate a high temperature and heat distribution mechanism in order to distribute the heat produced as taught by Sakamoto et al.

27. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al., McGrath et al., Traum, Jeromin et al. and Sakamoto et al. as applied to claims 7 and 8 above, and further in view of U.S. Patent No. 4,531,047 to Canfield et al.

28. Sato et al., McGrath et al., Traum, Jeromin et al. and Sakamoto et al. disclose the invention substantially as claimed and as described above.

29. However, Sato et al., McGrath et al., Traum, Jeromin et al. and Sakamoto et al. fail to teach the heat distribution mechanism including a reflective surface, such as a parabolic mirror.

30. Canfield et al. disclose a heating element comprising a heater in a metal shape (12) for the purpose of mounting the heater; a coil (5) wrapped about a ceramic base (6a) for the purpose of supporting the coil (column 2, rows 53-59); and a reflective parabolic surface (Figure 6) for the purpose of distributing heat generated by said heating element (column 2, rows 53-59).

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31. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided the following in Sato et al., McGrath et al., Traum, Jeromin et al. and Sakamoto et al.: a heating element including a reflective parabolic surface in order to distribute heat generated, as taught by Canfield et al.

Conclusion

31. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. USP to 5,223,113 to Kaneko discloses a thermal insulation device for abutting chambers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 571.272.1440. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571.272.1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Karla Moore
Patent Examiner
Art Unit 1763
14 April 2005